

Export Share of U.S. Agricultural Production

The export share of agriculture production serves as an indicator of the importance of the foreign market for U.S. farm products. It changes over time as supply and demand conditions change in foreign and domestic markets. In general, the share for total agriculture is rising as population and per capita expenditure on U.S. farm products grows faster abroad. As the share rises U.S. farm income becomes more dependent on the foreign market.

Background

The calculation of the export share of production is complicated by the fact the total value of agricultural exports contains more than just farm sales. Farm output can be directly exported as primary commodities or indirectly exported as processed products. Value is added to farm and related products at various stages beyond the farm level.

Food preparations, fruit juices, wine and beer are examples having a large off farm value-added component. In addition, there are nonagricultural products which are derived from primary agricultural commodities. Leather, yarn and thread, tobacco products, organic chemicals, and distilled spirits are examples. Although highly processed items are an important source of income in the general economy, they do not represent a significant share of cash farm receipts. This is because much of the value-adding activity occurs outside the farm sector.

For the purpose at hand in estimating the export share of farm production, it is impractical to exhaustively account for all end-uses of farm output. Of most importance are sales of primary crops and livestock. Grains, oilseeds, livestock and products, and fresh fruit and vegetables accounted for 75 percent of total agricultural export value in 1996. The export share of production is based on these primary commodities.

Total agricultural farm sales is split nearly equally into crops and livestock. Table 8 displays the shares of farm sales of crops and livestock from 1988 to 1996. One potential problem in calculating an export share of total agricultural production is double counting output from one

sector that is an input for another sector. The livestock sector is vertically linked with the sector purchasing feed grains from the crops sector. Technically, feed grains sold to livestock would not be considered a final output from the agricultural sector but rather as an intermediate within the agricultural sector. Thus, feed grains fed to domestic livestock would not be counted as agricultural output in the calculation of total farm output. Estimates from the U.S. input-output table used by ERS, show that the share of feed cost in livestock production is approximately 35 percent. Although this cost share can change from year to year as the price ratio of feed to livestock fluctuates, it nonetheless can be said that on average for every \$100 worth of livestock sold, \$35 worth of feed grain is sold. Grains fed to animals are accounted for as an output in the sale of livestock products sold domestically or exported.

Because certain crops are storable they can be exported at some future period. The timing of production and exports present another complication in estimating the export share of production. With storage exports can be drawn from previous production periods. This was the case for a number of exported commodities in 1995 and 1996. For example, soybean stocks dropped from 9 million tons in 1994 to 5 million tons in 1995 and subsequently to a near-record low in 1996. Table 9 show stocks levels and stocks as a percent of production for key commodities where stocks play a role in exports.

Due to fluctuations in year to year production the export share of production for storable commodities can fluctuate widely. Ideally the export share should be based on actual quantity supplied to the market rather than harvested production of a particular year. Therefore in calculating an export share, current harvested production is adjusted with stock changes to reflect quantity supplied as opposed to current harvested production previously used in USDA estimates. From table 11 we see that the U.S. exported 37.7 million tons of wheat in fiscal 1989. If we use the traditional approach by using production in 1988 of 49.3 million tons we obtain an export share of production of 76 percent. Wheat stocks decreased by 15.2 million tons between end of year 1987 and 1988 which effectively boosted the quantity supplied to foreign and domestic markets. Adding the stock change to 1988's production we obtain domestic supply of 64.5 million tons. Using this figure as the production base the revised export share becomes 58

percent. Similar adjustments to production were made for grains, oilseeds and almonds.

Exports Shares Estimates for 1988-1996

Tables 12 and 13 display the export shares for selected commodities and aggregate shares for crops, livestock, and total agriculture. The agricultural export share of production in fiscal 1996 was 21.4 percent, up from the early 1990's and from the previous year. Stronger foreign demand for meat and grains relative to domestic demand largely explains the increase. In the past year as prices of feed grains rose from increased foreign demand, it forced U.S. livestock producers to reduce feed usage through liquidation of livestock. This increased the export share from 30.4 percent in 1995 to 31.1 percent in 1996.

In the past 8 years one of the most significant changes for individual commodities is the rapid rise in the export share of meats. The share of poultry sales sold to the foreign market rose from 4.3 percent in 1988 to 17 percent in 1996. The export share of beef and pork still remain relatively low but are rising. Rapid growth in foreign meat demand and slower consumption growth in the domestic market as been the key factor in pushing the total agricultural export share higher. Foreign demand for U.S. meat indirectly increases demand for feed grains.

Fluctuations in exports of citrus fruit have mirrored fluctuations in the export share but in general has increased since the late 1980's. The foreign market has become increasingly important for apples. The export share increased steadily from 6.2 percent in 1988 to over 12 percent in 1996. Almond sales rely heavily on exports. While not a typical year, 97 percent of almond production, adjusted for stock changes, was sold abroad in 1996.

Trends in the export share of production for grain and oilseed crops are less apparent than for other commodities. In general, domestic feed use of coarse grains and oilseed has increased more than sales to the export market since the 1980's, pushing the export share of production down for most feed grains and oilseeds. But because of tight world supplies of feed grains in the world market in 1995 and 1996 the export share rose. The export share for corn did not increase nearly as high as in the early 1980's when it was above 30 percent. Similarly, in the early 1980's the

export share for soybeans was as high as 45 percent but has remained below 35 percent in recent years. The export share for sunflower seed fell from 1988 to 1994 but rose in 1995 and 1996, reflecting stronger foreign demand for oilseeds. Foreign and domestic demand for cotton and tobacco tend to fluctuate from year-to-year giving no clear trend in the export shares. Cotton relies more heavily on the foreign market than does tobacco. The export share for cotton has remained in the range of 40-50 percent while the tobacco share fluctuates in the range of 14-19 percent

(Mark Gehlhar, Agricultural & Trade Outlook Branch, 202-694-5273).

Table 8-- Shares of cash receipts from agriculture by individual subsector

Commodity	1988	1989	1990	1991	1992	1993	1994	1995	1996*
Percent									
Livestock and products	52.7	52.2	52.6	51.1	50.0	50.8	48.8	46.8	46.6
Meat animals	30.9	29.0	30.2	29.9	27.9	28.6	25.9	24.0	24.0
Dairy products	11.7	12.0	11.9	10.7	11.5	10.8	11.0	10.7	10.8
Poultry/eggs	8.5	9.6	9.0	9.0	9.1	9.8	10.2	10.3	10.5
Crops	47.3	47.8	47.4	48.9	50.0	49.2	51.2	53.2	53.4
Food grains	4.9	5.1	4.4	4.4	4.9	4.6	5.3	5.4	5.1
Wheat	4.2	4.5	3.8	3.7	4.2	4.2	4.3	4.7	4.7
Feed grains	9.4	10.6	11.0	11.5	11.7	11.4	11.2	12.5	12.8
Cotton	3.0	3.1	3.2	3.1	3.0	3.0	3.7	4.1	3.1
Tobacco	1.4	1.5	1.6	1.7	1.7	1.7	1.5	1.4	1.4
Oil crops	8.9	7.4	7.2	7.6	7.8	7.4	8.1	8.0	8.2
Vegetables	6.5	7.2	6.8	6.9	6.9	7.6	7.6	8.0	8.0
Fruits/nuts	6.0	5.7	5.6	5.9	5.9	5.8	5.6	5.8	5.7
All other crops	7.2	7.2	7.5	7.8	8.0	7.9	8.2	8.2	8.1

*1996 preliminary

Table 9--Ending stocks levels and stocks as a share of production for selected crops

Commodity	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1,000 metric tons										
Soybeans	11,878	8,232	4,954	6508	8,955	7578	7,955	5,691	9,112	4,992
Wheat	49,557	34,315	19,095	14600	23,627	12928	14,442	15,472	13,787	10,234
Corn	124,001	108,186	49,035	34151	38,641	27949	53,672	21,595	39,571	10,819
Sorghum	18,882	16,832	11,164	5582	3,622	1351	4,446	1,208	1,819	467
Cotton	1,094	1,257	1,544	653	510	806	1,015	769	577	568
Almonds	65	36	103	122	92	109	67	59	47	93
stocks as share of production (percentage)										
Soybeans	22.5	15.6	11.8	12.4	17.1	14.0	13.3	11.2	13.3	8.4
Wheat	87.1	59.8	38.7	26.3	31.8	24.0	21.5	23.7	21.8	17.2
Corn	59.3	59.7	39.2	17.9	19.2	14.7	22.3	13.4	15.4	5.8
Sorghum	79.2	90.7	76.2	35.7	24.9	9.1	20.0	8.9	11.0	4.0
Cotton	51.6	39.1	46.0	24.6	15.1	21.0	28.7	21.9	13.5	14.6
Almonds	31.0	32.0	34.5	46.0	41.4	37.0	30.2	23.9	20.9	27.9

Table 10--U.S agricultural production, selected commodities*

Commodity	1988	1989	1990	1991	1992	1993	1994	1995	1996
1,000 metric tons									
Beef and veal	10,625	10,421	10,266	10,342	10,418	10,406	10,105	11,222	11,631
Poultry	9,272	9,931	10,645	11,204	11,885	12,396	13,206	13,786	14,580
Pork	7,086	7,148	6,940	7,234	7,794	7,725	8,009	7,995	7,791
Oranges	7,757	8,118	7,026	7,120	8,082	9,972	9,370	10,371	10,635
Grapefruit	2,541	2,580	1,794	2,047	2,018	2,532	2,414	2,642	2,466
Apples	4,114	4,478	4,363	4,371	4,746	4,796	5,140	4,713	4,714
Grapes	5,472	5,380	5,135	5,040	5,473	5,456	5,325	5,364	5,016
Almonds	268	222	299	222	249	222	333	168	236
Corn	181,143	125,194	191,320	201,534	189,868	240,719	160,954	256,621	187,305
Wheat	57,362	49,320	55,428	74,292	53,891	67,135	65,220	63,167	59,400
Rice	4,109	5,186	5,087	5,098	5,096	5,704	5,240	6,648	5,631
Sorghum	18,563	14,648	15,632	14,563	14,856	22,227	13,569	16,491	11,694
Soybeans	52,736	42,152	52,354	52,416	54,065	59,612	50,919	68,493	59,243
Sunflower seeds	1,183	813	798	1,031	1,639	1,163	1,167	2,194	1,819
Cotton,raw	3,214	3,355	2,655	3,376	3,835	3,531	3,513	4,281	3,897
Tobacco	1,793	1,728	1,697	1,627	1,676	1,688	1,700	1,607	1,626

* Grains, soybeans, sunflowerseed, and almonds are adjusted for changes in stocks

Table 11--U.S. agricultural exports, selected commodities

	1988	1989	1990	1991	1992	1993	1994	1995	1996
1,000 metric tons									
Beef and veal	223	350	359	386	444	431	494	577	631
Poultry	390	418	563	628	794	986	1,377	1,911	2,343
Pork	57	85	88	87	129	135	172	261	298
Oranges	350	385	503	265	499	578	566	599	536
Grapefruit	117	136	174	190	218	185	216	205	240
Apples	296	254	357	371	530	488	663	663	565
Grapes	462	481	301	459	447	445	462	482	497
Almonds	187	166	169	198	185	177	182	232	302
Corn	43,955	50,676	59,854	44,497	40,693	41,766	33,057	58,645	52,681
Wheat	40,523	37,660	28,064	26,792	34,322	36,039	31,145	32,088	33,708
Rice	2,173	3,041	2,491	2,395	2,279	2,710	2,433	3,763	2,826
Sorghum	6,073	8,037	7,241	5,779	7,455	6,652	5,246	5,653	4,757
Soybeans	21,045	14,093	17,229	15,139	19,277	20,400	16,364	23,584	22,372
Sunflower seeds	251	87	95	86	105	84	73	253	183
Cotton,raw	1,388	1,441	1,666	1,565	1,494	1,125	1,566	1,981	1,642
Tobacco	219	220	223	226	261	208	197	209	222

Table 12--Export share of production: selected commodities and totals

Commodity	1988	1989	1990	1991	1992	1993	1994	1995	1996
Percent									
Beef and veal	2.1	3.4	3.5	3.7	4.3	4.1	4.9	5.1	5.4
Poultry	4.3	4.5	5.7	5.9	7.1	8.3	11.1	14.5	17.0
Pork	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.3
Oranges	5.0	5.0	6.2	3.8	7.0	7.2	5.7	6.4	5.2
Grapefruit	5.0	5.4	6.7	10.6	10.7	9.2	8.5	8.5	9.1
Apples	6.2	6.2	8.0	8.5	12.1	10.3	13.8	12.9	12.0
Grapes	9.7	8.8	5.6	8.9	8.9	8.1	8.5	9.0	9.3
Almonds	51.6	57.3	66.2	71.7	71.6	80.8	67.7	81.8	97.1
Corn	22.3	27.5	29.0	22.6	20.3	19.4	17.1	24.6	24.4
Wheat	55.8	58.4	46.8	41.1	53.1	54.9	48.5	49.5	53.5
Rice	45.5	57.2	49.0	46.4	45.4	50.9	43.2	58.2	48.1
Sorghum	29.5	39.6	34.1	35.0	43.5	34.8	31.2	35.6	36.5
Soybeans	37.3	31.0	33.9	30.3	34.8	34.4	30.8	36.2	35.3
Sunflower seeds	20.3	9.4	11.2	8.9	7.2	6.0	6.1	11.6	10.7
Cotton	45.5	47.0	47.0	44.5	42.2	33.9	41.7	44.3	42.0
Tobacco	14.0	15.3	18.9	17.8	17.1	14.5	14.0	15.1	14.1

Table 13--Export share of production: selected commodities and totals

Commodity	1988	1989	1990	1991	1992	1993	1994	1995	1996
Percent									
Primary crops	25.8	27.0	28.4	31.9	27.2	28.7	26.4	30.4	31.1
Meat and livestock	7.4	8.6	8.6	8.1	7.6	9.2	9.2	9.6	11.3
Total agriculture	15.9	16.3	16.9	18.1	17.2	18.2	17.6	20.2	21.4